

REMARKS

Reconsideration of the rejections set out in the Office action dated March 17, 2004 is respectfully requested. A petition for a one-month extension of time, and an accompanying fee are enclosed.

I. Claim amendments

Independent claim 1 has been amended to include limitations that (i) the second electrode is disposed between the liquid-support plate and the substrate, (ii) the second electrode defines an electrode gap, and (iii) the electrode gap is adapted to accommodate movement of a liquid droplet ejected from a liquid-support region to a sample region. These limitations are found in claim 9 or are apparent from the specification and drawings, e.g., Figs. 2 and 12, and the description of these figures in the specification.

Claim 3 has been amended to include limitations of originally presented claim 1 relating to droplet size, pulse amplitude and pulse duration.

Claim 5 has been amended to include the limitation that the spacing between the meniscus in the liquid support plate and the second electrode is between 0.1-5 mm, as disclosed, for example, on page 4, lines 22 and 23.

The amendments to claims 19 and 21 mirror those to claims 1 and 3, respectively.

Newly added claim 29 is directed to the apparatus described on page 10, line 28 to page 11, line 13 with respect to Figs. 12A-12C. All of the claimed elements and their relationships are disclosed in this passage and figures.

Newly added claim 30 includes the limitation of amended claims 3 and 21.

No new matter has been added by any of these claim amendments.

II. Rejections under 35 U.S.C. §112, second paragraph

Claims 2, 3, 12, 13, 16 and 17 were rejected under 35 U.S.C. §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the

subject matter which the applicants regard as their invention. These rejections are respectfully traversed in view of the foregoing amendments and following remarks.

Claim 2 has been cancelled and the limitation in claim 3 having to do with the type of liquid sample intended to be dispensed has been deleted.

Claims 12 and 13 have been amended to clarify that the claimed limitation relating to the application of voltage potential to the first-electrode connections is an operational feature of the claimed control unit. That is, these claims further limit the scope of the claimed control unit by defining a further operational characteristics of the unit. The use of functional language to describe the operation of a control unit in an apparatus is both acceptable and in many cases, necessary to describe the control unit. The applicant is unaware of any case law to the contrary.

Claims 16 and 17, as originally presented, further limit the scope of the claimed control unit by defining a further operational characteristics of the unit. This limitation is acceptable and meets the definiteness requirement of 35 U.S.C. §112, second paragraph, for the same reasons just discussed with respect to amended claims 12 and 13.

For these reasons, the applicants submit that claims 3, 12, 13, 16 and 17 comply with the requirements of 35 U.S.C. §112, second paragraph.

III. Rejections under 35 U.S.C. §103(a)

Claims 1-6, 10-13, 15, 18-22, 25, and 27-28 were rejected under 35 U.S.C. §103(a) as being unpatentable over Shimosato (U.S. Patent No. 4,864,327). Claims 7-9, 14, 23-24, and 26 were objected to as being dependent on a rejected base claim. These rejections and objections are respectfully traversed in view of the foregoing amendments and following remarks.

With respect to the apparatus claims, the Examiner has indicated that the prior art of record does not fairly teach or suggest a second electrode that is disposed between the liquid-support plate and substrate, and defines an electrode gap through which a liquid droplet passes when ejected from a liquid-support region to a sample region.

As currently amended, claim 1 now includes the limitations that (i) the second electrode is disposed between the liquid-support plate and the substrate, (ii) the second electrode defines an electrode gap, and (iii) the electrode gap is adapted to accommodate movement of a liquid droplet ejected from a liquid-support region to a sample region.

These structural limitations, which closely mirror those from claim 9, therefore define claim 1 patentably over the prior art.

The remaining dependent apparatus claims patentably define over the prior art for the same reason that claim 1 does, and in the case of claims 7, 8, and 14, for the additional reasons noted by the Examiner.

As currently amended, independent method claim 19 includes the step, in the operation of the apparatus of amended claim 1, placing the electrode gap in the second electrode in the apparatus between the liquid-support plate and the substrate, and positioned therein to accommodate movement of a liquid droplet ejected from a liquid-support region to a sample-holding region, and

These limitations, coupled with the inherent limitations in claim 19 that the second electrode defines an electrode gap, distinguishes the claimed invention over the prior art for the same reasons applied to claim 1.

The remaining dependent method claims patentably define over the prior art for the same reason that claim 19 does, and in the case of claims 23, 24, and 26, for the additional reasons noted by the Examiner.

Newly submitted claim 29 includes the limitations, in an apparatus for depositing liquid droplets of:

(i) a first electrode operatively connected to a liquid support region, for electrical contact with a meniscus supported in such region,

(ii) a second electrode carried on the structure and defining an electrode gap aligned with the liquid-support region to accommodate movement of a liquid droplet ejected from the liquid-support region onto such a substrate, and

(iii) a control unit including a power source for applying a voltage potential across the two electrodes, thereby to eject a selected volume of the liquid from said liquid-

support region onto such a selected region on such a substrate.

The claim structure thus includes a second electrode supported between a first electrode and a substrate, where the second electrode defines a gap positioned to accommodate movement of a liquid droplet ejected from a liquid-support region onto such substrate. These limitations define over the prior art for the same reasons that amended claim 1 does.

Dependent claim 30 patentably distinguishes over the prior art by its dependence on claim 29. Further, applicants submit, with respect to this claim and amended claims 3 and 21, that the prior art fails to show or suggest the ability to dispense droplets in a selected femtoliter to nanoliter range, by the particular voltage potential characteristics claimed.

IV. Conclusions

In view of the foregoing, the applicant submits that the claims now pending in this application are now in condition for allowance. A Notice of Allowance is, therefore, respectfully requested.

If in the opinion of the Examiner a telephone conference would expedite the prosecution of the subject application, the Examiner is encouraged to call the undersigned at (650) 838-4401.

Respectfully submitted,



Peter J. Dehlinger
Registration No. 28,006

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Correspondence Address:

PAYOR NUMBER 22918
PHONE: (650) 838-4403
FAX: (650) 838-4350